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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/763,315

01/23/2004

Shinya Ito

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23389

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06/29/2006

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EXAMINER

SARKAR, ASOK K

ART UNIT

PAPER NUMBER

2891

DATE MAILED: 06/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/763,315	Applicant(s) ITO, SHINYA	
	Examiner Asok K. Sarkar	Art Unit 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 9-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 2, 2006 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 – 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang, US 6,448,167.

Regarding claim 1, Wang teaches a method of fabricating a semiconductor device, comprising in sequence:

- (a) forming an oxide film 11 entirely over a semiconductor substrate 1 on which a MOS transistor is fabricated (see Fig. 8);
- (b) carrying out first thermal – annealing to said semiconductor substrate (column 5, lines 14 –16);

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- (c) removing said oxide film in an area where later mentioned semiconductor – metal compound is to be formed (see Fig. 9 and in column 5, lines 22 – 30);
- (d) forming a metal film entirely over said semiconductor substrate (column 5, lines 53 – 54); and
- (e) carrying out second thermal – annealing to said semiconductor substrate to form semiconductor – metal compound in said area (see Fig. 10, lines 55 – 57).

Regarding claim 2, Wang teaches removing said metal film having been not reacted with said semiconductor substrate in column 5, lines 60 – 65.

Regarding claim 3, Wang teaches silicon substrate in column 3, 14 – 16 and the semiconductor – metal compound as silicide in column 5, line 58.

Regarding claim 4, Wang teaches metal film as cobalt in column 5, line 53.

Regarding claim 5, Wang teaches the oxide film is formed by chemical vapor deposition (CVD) in the range of 300 to 500 degrees centigrade both inclusive by the thickness of 20 to 40 nanometers both inclusive in column 5, lines 4 – 14.

Regarding claim 6, Wang teaches the first thermal – annealing is carried out as spike rapid thermal annealing (RTA) by zero second in the range of 1000 to 1100 degrees centigrade in column 5, lines 13 – 17.

Regarding claim 7, Wang teaches the first thermal – annealing is carried out also for activating impurities having been implanted into source and drain regions of said

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MOS transistor, and for removing defects in said source and drain regions in column 5, lines 4 – 14.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, US 6,448,167 in view of Keppler, US 6,162,689.

Regarding claim 8 and 15, Wang fails to teach forming a trench such as shallow trench isolation in the semiconductor substrate and filling said trench with oxide to define an area in which a semiconductor device is to be fabricated.

Keppler teaches a shallow trench isolation in semiconductor substrate which is formed by forming a trench in the semiconductor substrate and filling said trench with

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oxide (called field oxide region) with reference to Fig. 1A in column 1, lines 22 – 30 for the benefit of manufacturing conventional CMOS device.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Wang and form a trench such as shallow trench isolation in the semiconductor substrate and filling said trench with oxide to define an area in which a semiconductor device is to be fabricated for the benefit of manufacturing conventional CMOS device as taught by Keppler in column 1, lines 22 – 30.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asok K. Sarkar whose telephone number is 571 272 1970. The examiner can normally be reached on Monday - Friday (8 AM- 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William B. Baumeister can be reached on 571 272 1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Asok Kumar Sarkar

Asok K. Sarkar

June 23, 2006

Primary Examiner